WHAT IS CLAIMED IS:

1. Stereoscopic display apparatus comprising:

two projectors having inputs connectable to a source of digital data representing the color components sets of two stereoscopic images, each of said projectors having an output outputting an optical beam having a set of color components in which at least one color component of the set is of an orthogonal polarization state with respect to the other color components of the set;

a polarization preserving screen;

an optical filter system using exclusively optical retarders to manipulate said polarization states for transforming the polarization states of the optical beams outputted by said two projectors into two color sets in which all the color components of one set are polarized in one polarization state and all the color components of the other set are polarized in an orthogonal polarization state;

and stacking means for stacking said two color sets onto said polarization preserving screen such as to enable stereoscopic viewing of the two color sets via orthogonally polarized filters.

2. The apparatus according to Claim 1, wherein said digital data representing said at least one color component of the two stereoscopic images is switched between the inputs of the two projectors.

3. The apparatus according to Claim 2, wherein said optical filter system includes at least one optical retarder in the form of a polarization transformer which transforms each color component inputted to it from one polarization state to another polarization state in such manner that mutually orthogonal polarization states are transformed to polarization states that are also mutually orthogonal.

4. The apparatus according to Claim 3, wherein said optical retarder of said polarization transformer is a half-wavelength retarder rotating the polarization state directions of the optical beam outputted by the respective projector.

5. The apparatus according to Claim 3, wherein said optical retarder of polarization transformer is a quarter-wavelength retarder converting the linear polarization of the optical beam outputted by the respective projector to a circular polarization.

6. The apparatus according to Claim 2, wherein said source of digital data includes a cable having a separate wire for each color component signal, and said switching of said at least one color component is effected by crossing the wires of said at least one color component between the inputs of the two projectors.

7. The apparatus according to Claim 2, wherein said switching of said at least one color component is effected by pre-processing said digital data before inputting same into the two projectors.

8. The apparatus according to Claim 1, wherein said optical filter system includes, for each projector, a polarization rectifier which transforms a plurality of color components in different polarization states at the input into the same polarization state at the output by using exclusively said optical retarders for polarization manipulation.

9. The apparatus according to Claim 8, wherein each polarization rectifier includes: a splitter which separates the color components into two optical paths, a polarization transformer in at least one optical path which utilizes a said optical retarder to transform the respective color component to another polarization state in such manner that mutually orthogonal polarization states are transformed to polarization states that are also mutually orthogonal; and a combiner which combines the two optical paths for stacking onto said polarization preserving screen.

10. The apparatus according to Claim 9, wherein said splitter is a dichroic mirror.

11. The apparatus according to Claim 9, wherein said splitter is a polarization beam splitter.

12. The apparatus according to Claim 8, wherein each polarization rectifier includes a stack of said optical retarders which align the polarizations of all the color components.

13. The apparatus according to Claim 12, wherein each polarization rectifier includes: a stack of said optical retarders which rotate the green color component polarization direction by 90° leaving the polarizations of the other color components intact; a half-wavelength retarder; and a polarization clean-up filter.

14. The apparatus in Claim 1, wherein said optical filter system further includes clean-up filters for increasing the polarization ratio of the color components of the optical beams outputted from the two projectors before stacking them on said polarization preserving screen.

15. The apparatus according to Claim 14, wherein said clean-up filters are conventional polarizers.

16. The apparatus according to Claim 15, wherein said clean-up filters are pleochroic polarizers.

17. The apparatus according to Claim 1, wherein said stacking means stacks said color sets outputted from said optical filter system by image warping onto said polarization preserving screen.

18. The apparatus according to Claim 1, wherein each of said projectors is an LCD projector outputting red and blue color components in one polarization state, and green color components in an orthogonal polarization state.

19. Stereoscopic display apparatus comprising:

two projection engines having inputs connectable to a source of digital data representing the color components sets of two stereoscopic images, each of said projectors having an output outputting an optical beam having a set of color components in which at least one color component of the set is of an orthogonal polarization state with respect to the other color components of the set;

a polarization preserving screen;

a polarization rectifier for each projection engine effective to manipulate said polarization states exclusively by optical retarders, and to transform the beams outputted by the projection engines to beams in which all color components have the same polarization state in such a manner that the two transformed beams have mutually orthogonal polarizations;

a polarization beam splitter for combining the transformed beams into one co-axial beam;

and a projection lens for imaging the stereoscopic images on said screen.

20. The apparatus according to Claim 19, wherein each polarization rectifier includes: a splitter which separates the color components into two optical paths, a polarization transformer in at least one optical path which utilizes a said optical retarder to transform the respective color component to another polarization state in such manner that mutually orthogonal polarization states are transformed to polarization states that are also mutually orthogonal; and a combiner which combines the two optical paths for stacking onto said polarization preserving screen.

21. The apparatus according to Claim 20, wherein said splitter is a dichroic mirror.

22. The apparatus according to Claim 20, wherein said splitter is a polarization beam splitter.

23. The apparatus according to Claim 19, wherein each polarization rectifier includes a stack of said optical retarders which align the polarizations of all the color components.

24. The apparatus according to Claim 23, wherein each polarization rectifier includes: a stack of said optical retarders which rotate the green color component polarization direction by 90° leaving the polarizations of the other color components intact; a half-wavelength retarder; and a polarization clean-up filter.